

Appl. No.: 09/966,987
Amdt. dated September 28, 2001
Reply to Office action of August 24, 2004

REMARKS

As required by the Official Action, Applicants have canceled the non-elected claims, that is, Claims 12-16, without prejudice to presentation in a subsequently filed divisional application. As such, Claims 1-11 and 17-26 remain pending in the present application.

The Official Action objected to the specification for having incorrectly spelled “portion” on page 10, line 18, as “potion”. Applicants have identified two instances in which “portion” was incorrectly spelled and have amended the respective paragraphs of the specification to correct the spelling. As such, Applicants submit that the objection to the specification is thereby overcome.

The Official Action rejects Claims 5, 6, 21 and 22 under 35 U.S.C. §112, second paragraph, as being indefinite since it is arguably unclear as to the location of the lens. Claims 5, 6, 21 and 22 have now been amended to recite that the lens, that is, the collimating lens in Claims 5 and 21 and the focal lens in Claims 6 and 22, is not only in optical communication with the distal end of the optical fiber, but is proximate the distal end of the optical fiber. This amendment is both consistent with the description provided by the specification and the assumption that is taken for examination purposes as indicated in paragraph six of the Official Action. Applicants therefore submit that Claims 5, 6, 21 and 22 definitively set forth the claimed subject matter, and the rejection under 35 U.S.C. §112, second paragraph, is thereby overcome.

The Official Action rejected Claims 1, 2, 11, 17 and 18 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,317,387 to Cornelis G. Van Hengel et al. in view of U.S. Patent No. 5,895,927 to Jeff Lee Brown. The Official Action also rejected Claims 5 and 21 under 35 U.S.C. §103(a) as being unpatentable over the Van Hengel ‘387 patent in view of the Brown ‘927 patent and in further view of U.S. Patent No. 3,817,635 to Ichizo Kawahara. Additionally, the Official Action rejected Claims 6, 7, 9, 22, 23 and 25 under 35 U.S.C. §103(a) as being unpatentable over the Van Hengel ‘387 patent in view of the Brown ‘927 patent and the Kawahara ‘635 patent and in further view of U.S. Patent No. 6,633,378 to James L. Doyle, Jr. Finally, the Official Action rejects Claims 10 and 26 under 35 U.S.C. §103(a) as being unpatentable over the Van Hengel ‘387 patent in view of the Brown ‘927 patent and in further

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view of U.S. Patent No. 5,325,177 to Lauren M. Peterson. The Official Action did confirm, however, that Claims 8 and 24 were allowable if rewritten in independent form. Claims 8 and 24 have now been rewritten in independent form and are submitted, along with Claims 9 and 25 which depend therefrom, to be in condition for immediate allowance for at least the reasons set forth by the Official Action. Additionally, original independent Claims 1 and 17 have been amended in order to more clearly define and to further patentably distinguish the claimed invention from the cited references, taken either individually or in combination. Based on the foregoing amendments and the following remarks, Applicants respectfully request reconsideration of the present application and allowance of the amended set of claims.

Independent Claims 1 and 17 are directed to an apparatus and method for measuring characteristics of a hole, respectively. As recited by independent Claim 1, the apparatus includes at least one optical fiber capable of being introduced into the hole. The optical fiber directs light radially toward a hole wall and receives light reflected off the hole wall. The apparatus also includes a light source for providing light to the optical fiber and an optical receiver for receiving light from the optical fiber that has been reflected off the hole wall and then received by the optical fiber. The optical receiver is also adapted to measure the intensity of the light reflected off the hole wall so as to permit different materials to be distinguished. As now amended, the apparatus of independent Claim 1 further recites that the “optical fiber is movable in a radial direction toward and away from then hole wall.” Movement of the optical fiber in a radial direction may be advantageous, such as in embodiments in which the light emitted from the optical fiber toward the hole wall is focused to a focal point such that the radial movement provided by the optical fiber permits the focal point to coincide with the hole wall as recited by dependent Claim 6, thereby facilitating improved measurement and characterization of the hole.

Similarly, the method of amended independent Claim 17 begins by introducing at least one optical fiber into the hole and transmitting light along the optical fiber and directing light from a distal end of the optical fiber toward the hole wall. Light that has reflected off the hole wall is received by the distal end of the optical fiber, and the intensity of the light reflected off the hole wall is measured to thereby permit different materials to be distinguished. As now amended, independent Claim 17 further recites “moving the optical fiber in a radial direction

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toward and away from the hole wall". As described above in conjunction with the amendments to independent Claim 1, the movement of the optical fiber toward and away from the hole wall may be advantageous and may improve the measurement and characterization of the hole in some embodiments.

None of the cited references teach or suggest movement of an optical fiber in a radial direction toward and away from the hole wall as now recited by amended independent Claims 1 and 17. While several of the references, including the primary reference, that is, the Van Hengel '387 patent, are silent and therefore do not teach or suggest movement of the optical fiber in a radial direction toward and away from the hole wall, the Brown '927 patent specifically teaches away from any such radial movement by specifying that the probe moves "along the cylindrical axis of the interior surface". See column 12, lines 22-23 of the Brown '927 patent. Moreover, the Doyle '378 patent, which is cited by the Official Action in paragraph fifteen for its apparent disclosure of the movement of an optical fiber in a radial direction does not, in fact, teach or suggest the movement of the optical fiber in a radial direction toward and away from the hole wall, as now recited by amended independent Claims 1 and 17. Instead, the Doyle '378 patent recites that "the scanning probe 1 is translated along the axis of the tube or pipe that is being inspected". See column 5, lines 19-21 of the Doyle '378 patent. Thus, the Doyle '378 patent also teaches away from the movement of the optical fiber in a radial direction toward and away from the hole wall, as now recited by amended independent Claims 1 and 17.

Since none of the cited references teach or suggest a hole inspection method and apparatus that includes an optical fiber capable of movement in a radial direction toward and away from the hole wall, any combination of the cited references would likewise fail to teach or suggest the radial movement of the optical fiber toward and away from the hole wall, as now recited by amended independent Claims 1 and 17. Thus, Applicants submit that the apparatus and method of amended independent Claims 1 and 17, as well as the claims that depend therefrom, are patentably distinct from the cited references and any combination thereof and accordingly submit that the rejections of the claims under 35 U.S.C. §103(a) are therefore overcome.

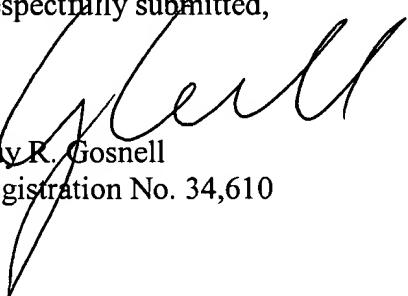
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CONCLUSION

In view of the amendments and the remarks presented above, it is respectfully submitted that all of the claims of the present application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

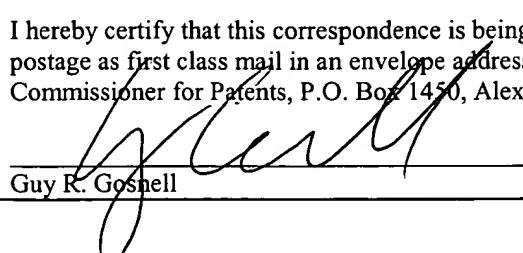
Respectfully submitted,


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